Appendix A
Risk Assessment Matrix

A hazard analysis describes the hazard, that is the action or agent that causes harm to life, property or the environment, and an estimate as to the likelihood that the harm will occur. A Risk Assessment Matrix is used at NREL to consistently equate these two factors to defined levels of risk.

The **Event Probability Classification Table** establishes event probabilities in six different classes: Impossible, Extremely Remote, Remote, Occasional, Reasonably Probable, and Frequent. The estimates of event probability defined in the Event Probability Classification Table were developed from NREL and industry experience and failure rate data. It is believed that the probability estimates provided in the table are conservative, that is they likely overestimate the occurrence of the identified accident.

The **Consequence Classification Table** is divided into four categories; Negligible, Marginal, Critical, and Catastrophic. These estimates are based on NREL and DOE experience, general industry experience, published literature, and numeric calculations. In general, the consequence estimates are conservative, that is they overestimate the result.

The **Risk Assessment Matrix** combines probability and consequence into a semi-quantitative measure of risk. In this table, risk is divided into four final classes; Routine Risk, Low Risk, Moderate Risk, and High Risk. "Routine Risk" is equated with those risks experienced by each of us during our daily lives. "Low Risk" events are those that produce minimal impact on health, safety, facilities or the environment. "Moderate Risk" events would produce considerable impacts to the employee, facility, or the environment. "High Risk" events are those with the potential for significant on-site and off-site impacts to a large number of persons or for major impact to the environment.

Event Probability Classification Table

Probability (Probability that the potential consequence occurs.)		
Level	**Annual Probability**	**Potential Consequences**
A	Frequent > 1.0	Likely to occur many times during the life cycle of the system (test/activity/operation).
B	Reasonably Probable 1.0 to 0.1	Likely to occur several times during the life cycle of the system.
C	Occasional 0.01 to 0.1	Likely to occur sometime during the life cycle of the system.
D	Remote 0.0004 to 0.01	Not likely to occur in the life cycle of the system, but possible.
E	Extremely Remote 0.000001 to 0.0001	Probability of occurrence cannot be distinguished from zero.
F	Impossible < 0.000001	Physically impossible to occur

Hazard Consequence Classification Table

Consequence		
Category	Description (Est. $ Lost)	Potential Consequences
I	Catastrophic (equip. loss > $1,000,000)	May cause death or system loss.
II	Critical ($100,000 to $1,000,000)	May cause severe injury or occupational illness, or minor system damage.
III	Marginal ($10,000 to $100,000)	May cause minor injury or occupational illness, or minor system damage.
IV	Negligible (< $10,000)	Will not result in injury, occupational illness, of system damage.

Risk Assessment Matrix